USE OF DORSAL CARINAL SPINES TO DIFFERENTIATE BETWEEN POSTLARVAE OF BROWN SHRIMP, *PENAEUS AZTECUS* IVES, AND WHITE SHRIMP, *P. SETIFERUS* (LINNAEUS)[1]

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ABSTRACT

The presence of spines on the dorsal carina of the sixth abdominal segment of postlarval brown shrimp, *Penaeus aztecus* Ives, distinguished them with almost 100-percent reliability from postlarval white shrimp, *P. setiferus* (Linnaeus), in field collections from the tidal pass at Galveston, Texas.

INTRODUCTION

The presence of spines on the dorsal carina of the sixth abdominal segment of postlarval brown shrimp, *Penaeus aztecus* Ives, and pink shrimp, *P. duorarum* Burkenroad, and the absence of spines on the dorsal carina of postlarval white shrimp, *P. setiferus* (Linnaeus), were reported by Ringo and Zamora (MS). They concluded that this character was potentially useful in separating postlarvae of brown and pink (grooved) shrimp from white (nongrooved) shrimp. Their conclusions were based, however, on shrimp of known parentage reared in the laboratory.

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The objective of the present study was to determine the accuracy of the carinal spine character in separating postlarvae of brown and white shrimp taken in field collections.

METHODS

Postlarval shrimp were collected from the tidal pass at Galveston, Texas with a hand-drawn beam trawl and transferred alive to a holding tank in the laboratory. Each postlarva taken from the holding tank was placed in a depression plate, examined for the presence or absence of carinal spines, measured (total length—tip of rostrum to tip of telson), and placed in one of two tanks, depending on whether or not spines were present. No shrimp were discarded, and individual rearing tanks were used for each separated sample.

The postlarvae were fed brine shrimp (*Artemia* sp.) and reared to the juvenile stage ($\geq$ 25 mm total length) by a technique described by Zein-Eldin (1963). After the shrimp became juveniles, they were taken from the tanks, preserved in 10-percent buffered formalin, and identified to confirm the earlier species separation based on the presence or absence of carinal spines.

ACCURACY OF IDENTIFICATION BASED ON THE CARINAL SPINE CHARACTER

The numbers of postlarval shrimp separated on the basis of the presence or absence of carinal spines, sampling dates, and mean total length of shrimp in each separated sample are shown in Table 1. The same table gives the numbers of postlarval shrimp reared to the juvenile stage for final identification. All

TABLE 1

Number and mean length of postlarvae separated according to the presence or absence of dorsal carinal spines and the number of juveniles identified as brown or white shrimp in relation to the initial identification based on the spine character

	Postlarvae in sample and mean total length				Identification of juveniles in relation to initial postlarval identification			
	Spines present		Spines absent		Spines present		Spines absent	
Sampling date	Number	mm	Number	mm	Brown	White	Brown	White
1967								
Feb. 14	150	12.3	0	..	135	0	0	0
Feb. 28	161	12.0	0	..	150	0	0	0
Mar. 13	150	12.0	0	..	118	0	0	0
Mar. 27	140	12.2	0	..	112	0	0	0
Apr. 13	150	12.6	0	..	106	0	0	0
May 10	142	10.4	0	..	106	0	0	0
May 26	26	10.5	100	6.9	18	0	0	93
June 27	74	10.5	99	7.0	57	1	0	88
July 11	125	10.7	20	7.0	93	0	0	13
Aug. 16	100	10.0	150	7.0	65	0	1	89
Sept. 14	79	11.0	168	8.0	8	0	0	136
Oct. 16	22	12.0	49	10.0	11	1	0	43
Total	1,319		586		979	2	1	462

juveniles were identified by the characters given by Burkenroad (1939) and Williams (1953).

The use of the carinal spine gave almost 100 percent accuracy in separating postlarvae of brown shrimp from postlarvae of white shrimp (Table 1). Of 979 postlarvae that had spines and survived to become juveniles, all but 2 were brown shrimp. Of 462 postlarvae without spines that survived to the juvenile stage, all but 1 were white shrimp.

The carinal spine character has proven useful in separating postlarvae of brown and white shrimp in the Galveston Bay area and in Louisiana (Woodrow Mock, Louisiana Wild Life and Fisheries Commission, Grand Isle, Louisiana; and Curt Rose, Francis T. Nicholls State College, Thibodaux, Louisiana, personal communication). The character is especially useful in parts of Texas, Louisiana, and other locations in the northern Gulf of Mexico because pink shrimp are rare in these areas (Baxter and Renfro 1967; Kutkuhn 1962).

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